

## CLAIMS

1. A vehicle wheel assembly comprising a rim (16) and a tire (18) defining between them a closed space (30) filled with gas under pressure, a reservoir (40) of gas under pressure, and means (50) for selectively connecting the reservoir (40) of gas under pressure to the closed space (30) defined between the rim (16) and the tire (18), the assembly being characterized in that the reservoir (40) of gas under pressure is constrained to rotate with the rim (16), and in that the reservoir (40) is disposed in the annular space (30) defined between the tire (18) and the rim (16).  
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2. A wheel assembly according to claim 1, characterized in that the reservoir (40) is filled with nitrogen.  
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3. A wheel assembly according to either preceding claim, characterized in that it includes a control unit (54) connected to the means (50) for selectively connecting the gas reservoir (40) to the closed space (30) to switch them between an open state and a closed state.  
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4. A wheel assembly according to claim 3, characterized in that it includes a sensor (80) for measuring the pressure inside said closed space (30), and in that said control unit (54) is adapted to switch said connection means (50) as a function of the pressure in said closed space (30).  
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- 30 5. A wheel assembly according to claim 3 or claim 4, characterized in that it includes a temperature sensor (82), and in that said control unit (54) is adapted to switch said connection means (50) as a function of the temperature measured by the sensor (82).  
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6. A wheel assembly according to any preceding claim, characterized in that said control unit (54) comprises:

· a remote data processor unit (68) that does not rotate with the rim (16);  
· a controller (62) for controlling the means (50) for selectively connecting the reservoir (40) to the closed space (30), said controller (62) being constrained to rotate with the rim (16); and  
· complementary wireless communications means (64, 66, 72, 74; 122, 124) connected firstly to said data processor unit (68) and secondly to said controller (62) to transmit commands from said data processor unit (68) to the controller (62).

7. A wheel assembly according to claim 4 or claim 5 and claim 8 taken together, characterized in that it includes complementary wireless communications means (64, 66, 72, 74; 122, 124) connected firstly to the or each sensor (80, 82) and secondly to said data processor unit (68) for transmitting the measured values from the or each sensor (80, 82) to said data processor unit (68).

8. A wheel assembly according to claim 6 or claim 7, characterized in that said complementary communications means comprise a rotary transformer (120) comprising two windings (122, 124) mounted to rotate relative to each other, one of the windings (122) being constrained to rotate with the rim (16).

9. A wheel assembly according to claim 6 or claim 7, characterized in that said complementary communications means comprise two antennas (66, 74) one of which is constrained to rotate with the rim (16) and the other of which is connected to the data processor unit (68) and does not rotate with the rim (16), being situated remotely therefrom.

35 10. A wheel assembly according to any one of claims 3 to 9, characterized in that it includes means (56) for

selectively venting said closed space (30), said means being connected to said control unit (54) to cause them to switch between an open state and a closed state.

- 5 11. A wheel assembly according to claim 10, characterized in that said means (50) for selectively connecting the reservoir (40) to said closed space (30) and said means (56) for selectively venting said closed space (30) comprise a three-port valve (100) with a first port (102) 10 connected to said closed space (30), a second port (104) connected to the reservoir (40), and the third port (106) connected to the atmosphere, the valve (100) including a selector (108) movable between a first position in which all three ports are closed, a second position in which 15 the first and second ports (102, 104) are put into communication, while the third port (106) is closed, and a third position in which the first and third ports (102, 106) are put into communication, while the second port (104) is closed.